

SamTrans 2021 Sustainability Report



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Acronym List

ACS	American Community Survey	kBTU	thousand British thermal units
APTA	American Public Transportation Association	kWh	kilowatt-hours
BART	Bay Area Rapid Transit	LCFS	Low Carbon Fuel Standard
BEB	battery electric bus	MTC	Metropolitan Transportation Commission
CAP	criteria air pollutants	MTCO ₂ e	metric tons of carbon dioxide equivalent
CARB	California Air Resources Board	NEPA	National Environmental Protection Act
CCAG	City/County Association of Governments of San Mateo County	N ₂ O	nitrous oxide
CEQA	California Environmental Quality Act	NTD	National Transit Database
CH ₄	methane	PCE	Peninsula Clean Energy
CNG	compressed natural gas	PG&E	Pacific Gas and Electric
CO ₂	carbon dioxide	p.p.	percentage points
COVID-19	SARS-CoV-2, commonly referred to as COVID-19 or Coronavirus	SFMTA	San Francisco Municipal Transportation Agency
District	San Mateo County Transit District	SLR	sea level rise
eGRID	emissions and grid resource integrated database	SMCEL JPA	San Mateo County Express Lanes Joint Powers Authority
EMFAC	CARB emission factor GHG emission tool	TA	San Mateo County Transportation Authority
FY	fiscal year	TCR	The Climate Registry
GGE	gallons of gasoline equivalent	UPT	unlinked passenger trips, also called "boardings"
GHG	greenhouse gas	VM	vehicle miles
GREET	Argonne National Laboratory greenhouse gases, regulated emissions, and energy use in technologies model	VTA	Santa Clara Valley Transportation Authority
HVAC	heating, ventilation, and air conditioning		
ICT	Innovative Clean Transit		
JPB	Peninsula Joint Powers Board, which operates Caltrain		

Message from Acting General Manager and CEO

Through the pandemic, SamTrans provided transportation to the thousands of essential workers who kept our communities running. SamTrans stands ready to help the people of San Mateo County get where they need to go without the burden of owning a car. In our increasingly congested region, SamTrans provides vital access to sustainable, affordable, and convenient transportation. Sustainability is central to SamTrans' vision of providing a safe, reliable, and modern bus system that meets the changing mobility needs of the San Mateo County.

SamTrans is amidst two major transitions that will fundamentally change how it operates. We have laid out a plan to convert our bus fleet to zero emission vehicles by 2038. This will mean our riders will enjoy some of the most technologically advanced vehicles in the world, while SamTrans shrinks its carbon footprint, and improves air quality.

At the same time, Reimagine SamTrans, a comprehensive analysis of the SamTrans bus system, is reinventing SamTrans' bus service from the ground up, determining how we can better tailor our routes to meet the needs of today's rider. The new reimaged network will launch in phases, beginning in mid-2022.

Together, these initiatives will bring more riders to our buses, while making our buses more sustainable.

I am pleased to share this sustainability report, which summarizes our environmental performance between fiscal years (FY) FY2019 and FY2020. It provides an inside look at sustainability projects we are proud of, and previews what else we have in store.

Let us show you how SamTrans makes San Mateo County a better place to live for everyone.

Sincerely,



Carter Mau
Acting General Manager and CEO



INTRODUCTION

About the San Mateo County Transit District

About this Report

Sustainability Performance Summary

About the San Mateo County Transit District

The San Mateo County Transit District (“District”) provides public transportation services within and outside of San Mateo County, California, a 455 square-mile area with a population of approximately 773,200 in 2020. The District leads the planning, development and management of a multi-modal public transportation system that includes buses, trains, shuttles, and paratransit services. The District is the managing agency operating four business units:



SamTrans

SamTrans provides fixed-route bus service including local and express service, paratransit, and shuttle services in San Mateo County. As of August 2021, SamTrans currently operates 306 fixed-route revenue buses, 70 paratransit vehicles, and administers a shuttle program to and from Caltrain and BART stations.



Caltrain

Caltrain provides commuter rail service serving 32 stations in three counties from San Francisco to Gilroy. Before the COVID-19 pandemic, Caltrain operated approximately 90 weekday trains, which included express, limited, and local trains. Caltrain is owned and operated by the Peninsula Corridor Joint Powers Board (JPB), which is comprised of three member agencies: The District, the City and County of San Francisco, and the Santa Clara Valley Transportation Authority (VTA).



San Mateo County Transportation Authority

The San Mateo County Transportation Authority (TA) administers the countywide sales tax dedicated to transportation-related projects and programs in the County. In 2004 San Mateo County passed Measure A, a half-cent sales tax to support transportation and infrastructure investment. In 2018 voters passed a half-cent sales tax (Measure W). The TA administers 50% of Measure W funds and SamTrans administers the other 50%.

San Mateo County Express Lanes Joint Powers Authority

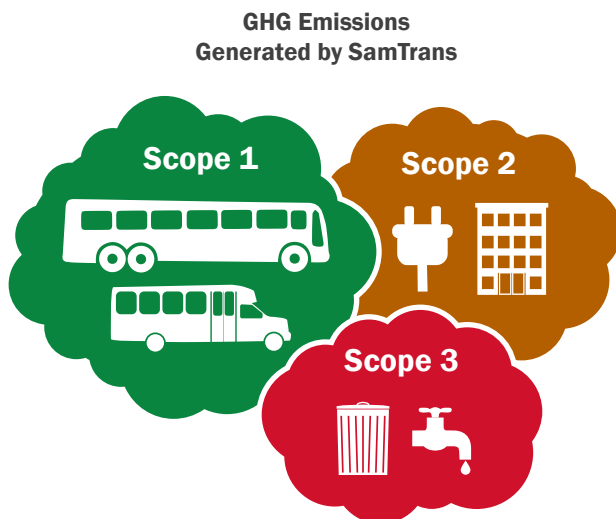
The TA and the City/County Association of Governments of San Mateo County (C/CAG) formed the San Mateo County Express Lanes Joint Powers Authority to manage and operate the US-101 Express Lanes Project, which will provide express lanes in north and southbound directions of US-101 in San Mateo County.

About this Report

This is SamTrans' third sustainability report. This report shares SamTrans' FY2019 and FY2020 sustainability performance, including key metrics and information about sustainability achievements. The report scope only encompasses facilities, fixed-route bus, paratransit, and shuttle services under the operational control of SamTrans. The report includes information on non-revenue vehicles, employee commuting, and centralized facility functions across all District units due to shared facilities and services. The District has prepared a separate sustainability inventory and report for Caltrain operations that does not include either non-revenue vehicles or employee commuting to avoid double-counting.

The greenhouse gas (GHG) emissions data in the report include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). They are presented in this report as metric tons of carbon dioxide equivalent (MTCO₂e). Other GHGs, such as sulfur hexafluoride and refrigerants, are excluded from this inventory.

GHG emissions are divided into three different categories, called "scopes." Scope 1 includes all emissions directly emitted by sources owned or controlled by SamTrans (e.g., revenue and non-revenue vehicle diesel, gasoline, and CNG fuel use and facility natural gas use); Scope 2 includes all indirect emissions from purchased electricity, heat and or steam; Scope 3 includes all other indirect emissions (e.g., GHG emissions from water, waste, employee commuting, and displaced passenger trips).



Consistent with The Climate Registry (TCR) and APTA, SamTrans reports all Scope 1 and 2 GHG emissions. SamTrans also reports Scope 3 GHG emissions associated with waste generation and diversion, water usage, employee commuting, and avoided/displaced customer trips.

This report includes the following sustainability indicators:

- GHG emissions
- GHG displacement
- Criteria air pollutant emissions
- Energy use from revenue vehicles
- Energy use from facilities
- Water use
- Waste generation and diversion
- Train miles
- Unlinked passenger trips (boardings)
- Displaced or avoided customer trips

Sustainability indicators are normalized by SamTrans' annual vehicle miles (VM), which includes miles traveled by fixed-route bus, paratransit and shuttle services. VM measures miles traveled from the time a vehicle pulls out from its garage to go into revenue service to the time it pulls in from revenue service, including "deadhead" miles without passengers to the starting points of routes or returning to the garage, or for deadhead moves to layover locations. Normalizing by VM enables SamTrans to evaluate improvements in vehicle and facility efficiency.



SamTrans is a signatory of the American Public Transportation Association's (APTA's) Sustainability Commitment. The Commitment provides a framework for transit agencies to manage sustainability within their agency and includes a set of key performance metrics for tracking sustainability performance. In April 2018, APTA recognized SamTrans with silver-level status for the agency's continued achievements in sustainability.

Sustainability Performance Summary¹

The following table provides information on SamTrans' sustainability performance since the publication of the previous sustainability report, which covered through FY2018. Information on data sources and methodology are included as end notes.

Indicator	Unit	FY2018	FY2019	FY2020	FY2018–FY2020 % Change
Greenhouse Gas Emissions					
Generated ⁱ	MTCO ₂ e	28,245	28,508	25,704	-9%
Displaced/ Avoided ⁱⁱ	MTCO ₂ e	-6,854	-6,679	-4,964	-28%
Net Total ²	MTCO ₂ e	21,391	21,829	20,740	-3%
Criteria Air Pollutant Emissions					
Generated ⁱⁱⁱ	tons	239	230	196	-18%
Displaced/ Avoided ^{iv}	tons	-33	-30	-21	-36%
Net Total ³	tons	206	200	175	-15%
Facility Energy Use^v					
Electricity	kWh	4,611,709	4,110,894	4,099,502	-11%
Natural Gas	therms	109,636	83,316	66,450	-39%
Total Facility Energy Use	kBTU	26,696,786	22,356,564	20,631,392	-23%
Vehicle Fleet Energy Use (Revenue and Non-Revenue)^{vi}					
Diesel	gallons	2,223,337	2,266,756	2,163,604	-3%
Gasoline	gallons	321,482	299,005	118,603	-63%
CNG	GGE	4,039	1,630	0	-100%
Biodiesel	gallons	6,391	6,365	6,442	1%
Electricity	kWh	0	0	30	100%
Non-Revenue Fleet Energy Use	kBTU	4,541,876	3,736,706	4,160,125	-8%
Total Vehicle Energy Use	kBTU	348,439,963	351,382,122	314,434,076	-10%
Water^{vii}					
Consumed ^{kviii}	gallons	6,895,812	7,847,065	7,012,986	2%
Waste and Recycling^{viii}					
Generated ^{ix}	tons	1,189	1,189	1,206	1%
Diverted (by weight) ^{xvi}	Percentage or Percentage Points	52%	52%	53%	1 p.p
Employee Commute^x					
(Commute) Vehicle Miles Traveled	miles	3,404,480	3,869,615	3,577,760	7%

¹Totals may not add due to rounding. A small number of past performance figures published in our 2019 report have been restated due to changes in emissions factors or more accurate information received after the publication of our 2019 report.

²Net GHG emissions equal SamTrans' generated emissions minus emissions displaced by SamTrans.

³Net CAP emissions equal SamTrans' generated CAPs minus CAPs displaced by SamTrans.

A photograph of two male technicians in a workshop, looking upwards at the underside of a vehicle. They are wearing dark work jackets and safety glasses. The technician on the left has a name tag that says "Roberto". The background shows various mechanical parts and tools. The entire image is overlaid with a blue tint, and a red vertical line runs down the left side.

SAMTRANS RIDERSHIP AND OPERATIONS

Ridership and Operations

SamTrans' ridership was profoundly reduced by COVID-19. To keep riders, staff, and operators safe during the pandemic, SamTrans greatly reduced service and suspended fare collection beginning in March 2020. This caused a 6.5% decline in vehicle miles between FY2019 and FY2020 (Figure 1). SamTrans also implemented social distancing on its revenue fleet, resulting in fewer passengers per vehicle.

SamTrans gradually restored service in response to pandemic improvements, first in August 2020 and again in January 2021. However FY2020 boardings decreased by approximately 19% between FY2019 and FY2020, and passenger miles traveled (PMT) decreased by approximately 24% (Figure 2 and Figure 3). This

loss of ridership as restrictions were lifted was not only detrimental to SamTrans, but also harmed the entire Bay Area's air quality, which relies on public transit to reduce congestion, air pollutants, and GHG emissions.

Even with ridership impacts from COVID-19 in FY2020, SamTrans' ridership was more stable than other commute-focused transit providers, indicating just how many riders depend on SamTrans service for primary transportation. The pandemic showed that SamTrans' service is critical for essential workers and people without access to a vehicle. As the COVID-19 pandemic continues, further impacts to ridership are expected which will be reflected in future reports.

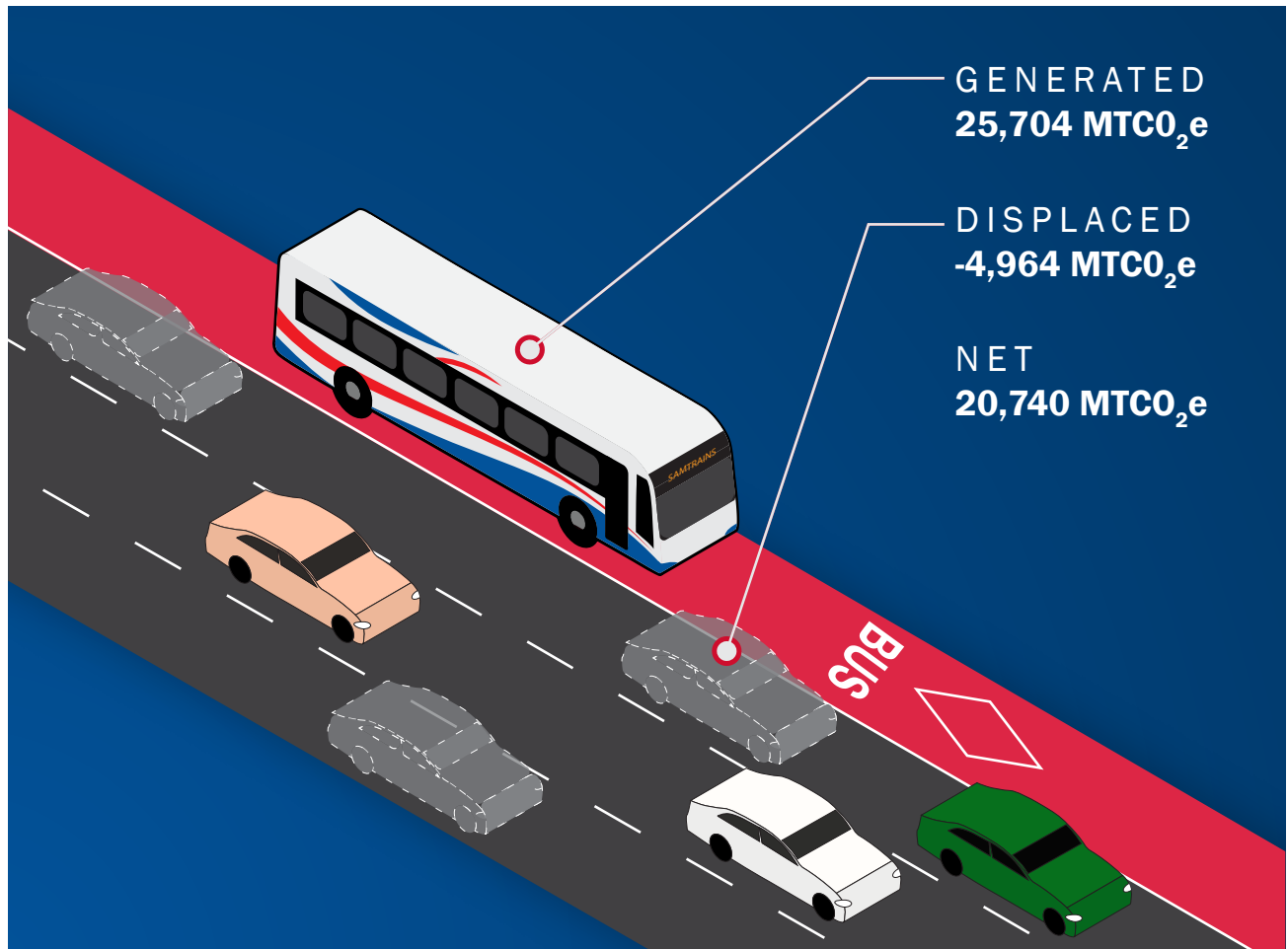
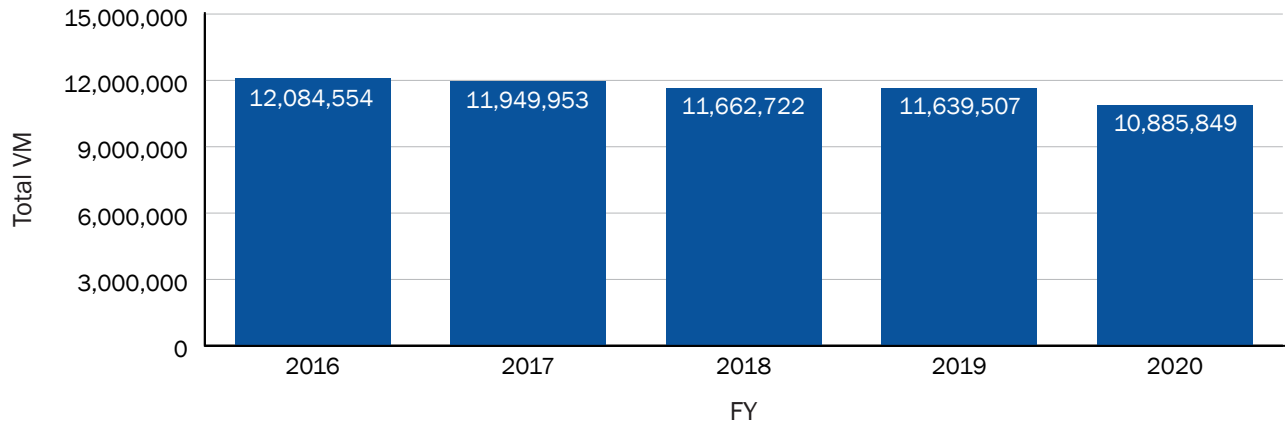
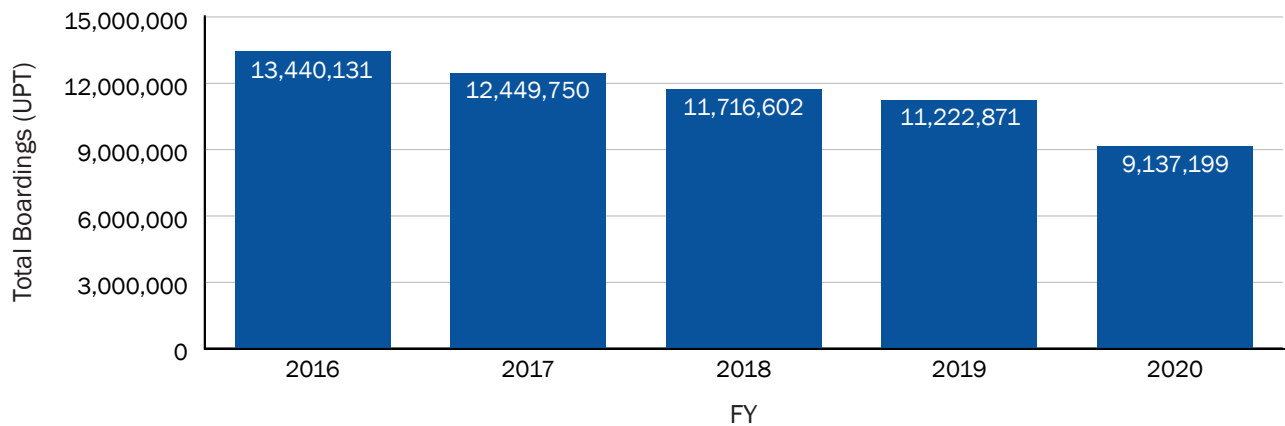
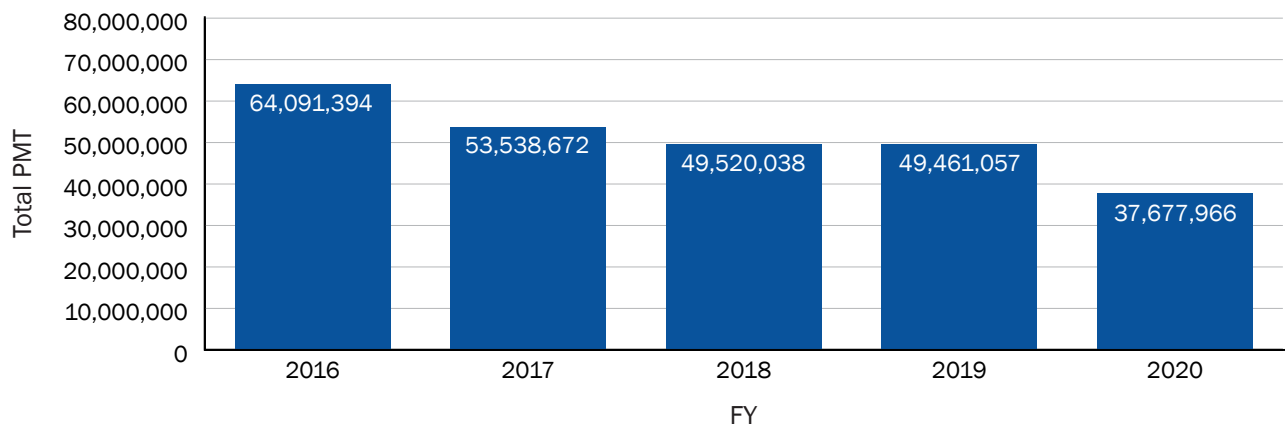


Figure 1: Total Annual SamTrans Vehicle Miles (VM)⁴**Figure 2: Total Annual Unlinked Passenger Trips (UPT)⁵****Figure 3: Total Annual Passenger Miles Traveled (PMT)⁶**⁴Ibid.⁵Federal Transit Administration, National Transit Database, FY 2016 to FY 2020 Reporting – San Mateo County Transit District. (Activity from the DT/PT mode and Transportation Authority Shuttle operations are excluded from this inventory).⁶Federal Transit Administration, National Transit Database, FY 2016 to FY 2020 Reporting – San Mateo County Transit District. (Activity from the DT/PT mode and Transportation Authority Shuttle operations are excluded from this inventory).



DIVERSITY AND EQUITY

Diversity and Equity

SamTrans' work at the intersection of equity and environmental impacts is key to its effort to be a more sustainable and effective public transportation agency. SamTrans is seeking opportunities to elevate equity beyond compliance with federal and state requirements. SamTrans previously addressed equity through required environmental justice analyses and compliance with legislation such as the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). SamTrans is now working to improve its understanding of its environmental impacts on communities of color, and how equity can be better integrated into operations. A few examples are summarized below.

GARE (Government Accountability on Race and Equity)

In September 2020, SamTrans joined the GARE network to provide staff with resources on how to address racial equity both internally and externally. Staff can utilize training opportunities and resources to compare best practices and to recognize various ways to incorporate equity into their work.

Partnership with CBOs

As part of Reimagine SamTrans, SamTrans developed intentional partnerships with community-based organizations (CBOs) serving communities of color and

low-income communities. SamTrans' goal is not only to improve outreach to these communities, but to provide an opportunity for meaningful feedback on the potential route changes from riders who use the service but may not be able to participate in traditional outreach events, especially during the pandemic. CBO engagement is intended to create long-lasting, meaningful relationships between CBOs and the agency. In particular, SamTrans' partnership with Nuestra Casa expanded outreach in East Palo Alto's predominantly Spanish speaking communities and allowed SamTrans staff to participate in Nuestra Casa's Environmental Justice Academy as observers.

The Environmental Justice Academy engaged parents and youth in advocacy and civic engagement through "parent academies", focused on training parents to advocate for their communities on environmental justice matters. For East Palo Alto, environmental justice not only includes access to better water and air, but also better parks and playgrounds, safer sidewalks, and improved access to reliable public transportation.

SamTrans was able to highlight its electric fleet while supporting Nuestra Casa's message of improving air quality and sustainability. This is an example of how partnerships between SamTrans and CBOs can teach communities about the benefits of public transportation.



SAMTRANS SUSTAINABILITY PERFORMANCE

Sustainability Program Achievements

Air Quality

Energy Use

Water Use

Waste and Diversion

Sustainability Program Achievements



-9%

Generated GHG emissions decreased by 9% between FY2018 and FY2020



-11%

Facility electricity use decreased by 11% between FY2018 and FY2020



-10%

Revenue and non-revenue vehicle total energy use decreased by 10% between FY2018 and FY2020

Innovative Clean Transit Plan

In December 2020, SamTrans approved an Innovative Clean Transit (ICT) Plan outlining its vision for transitioning from a diesel fleet to a zero-emission bus fleet by 2038, in accordance with the California Air Resources Board's Innovative Clean Transit regulation. The ICT Plan identifies SamTrans' projected procurement schedule for its zero emission buses as well as its plan to overhaul its bus bases and prepare them for 24/7 electric charging capability.

Adaptation and Resilience Plan

In recognition of the need to protect its future zero-emission fleet and infrastructure, SamTrans completed an Adaptation and Resilience Plan (Plan) in February 2020. The Plan identifies SamTrans' vulnerability to sea level rise (SLR), flood, and heat-related climate change impacts on SamTrans' assets and services, and presents options to improve the agency's resilience. The SLR and flooding vulnerability assessment focused on SamTrans' North and South Base facilities, while the heat vulnerability assessment focused on SamTrans' fleet and passengers. Those reports can be found [here](#).

Energy Procurement Study

In preparation for the electrification of the fleet, SamTrans also completed an Energy Procurement Strategy Study (Energy Study) and adopted an Energy Policy in May 2021 to help determine how it should meet its future electric demand. As SamTrans transitions from diesel to zero-emission buses, electricity will become an increasingly important component of the agency's fuel spend, carbon footprint, and potential revenue-generation from programs such as the Low Carbon Fuel Standard (LCFS). The Energy Study evaluated SamTrans' short- and medium-term energy procurement and power resilience options, helping SamTrans make informed decisions on vital infrastructure and to plan holistically for new and emergent technologies. Read the Energy Strategy Study and Energy Policy [here](#).

Air Quality

GHG Emissions

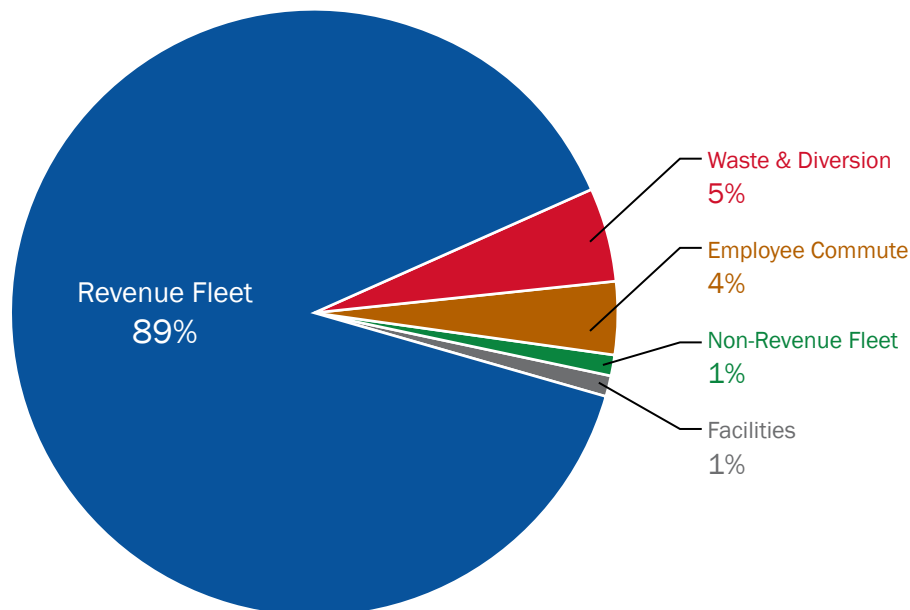
SamTrans generates GHG emissions directly through the operation of its revenue fleet (i.e., fixed-route bus, paratransit, and shuttle services), which is currently powered by diesel fuel, gasoline, and a small percentage of other fuels (e.g., biodiesel, electric). A small amount of GHG emissions is generated from SamTrans' service vehicles (non-revenue fleet) as well as through natural gas used for facility heating. SamTrans purchases 100% GHG-free and renewable electricity through Peninsula Clean Energy (PCE), and therefore does not generate any emissions associated with electricity.

SamTrans calculates indirect GHG emissions generated from waste disposal, water consumption, and employee commuting. SamTrans also accounts for displaced emissions that would have occurred if travelers chose to travel by private automobile and calculates these as avoided emissions. [Figure 4](#) shows SamTrans' GHG emissions by source.

SamTrans' net GHG emissions equal its generated emissions less emissions displaced by SamTrans. [Figure 5](#) shows a line graph of SamTrans net GHG emissions, with generated and displaced emissions highlighted as bars for each fiscal year. This figure demonstrates that increased efficiency has resulted in a sustained trend of declining generated GHG emissions.

In FY2019 and FY2020 SamTrans generated approximately 28,508 and 25,704 MTCO₂e, respectively. Generated emissions declined approximately 9% between FY2018 and FY2020 due to an approximate 6.7% reduction in revenue fleet VM primarily stemming from COVID-19. During this same time frame, SamTrans displaced approximately 28% fewer GHG emissions due to a 24% decrease in PMT resulting from ridership declines caused by COVID-19. As SamTrans transitions to a zero-emission fleet and incorporates electric vehicles into its non-revenue fleet, its generated GHG emissions will decrease significantly and it will displace more emissions than it generates.

Figure 4: FY2020 GHG Emissions by Source⁷



⁵No emissions from water were generated in FY2020.

Figure 6 illustrates how much CO₂e SamTrans generates per vehicle mile it operates, and per passenger that boards. Between FY2018 and FY2020, GHG emissions per VM declined by approximately 3%, indicating SamTrans is generating fewer GHG emissions per mile than in its last reporting period.

This improvement is a result of replacing older buses with more efficient vehicles and retrofitting existing buses with energy-saving equipment. However in the same period, generated emissions per boarding increased by approximately 14%, likely due to the ridership impacts of COVID-19, and are expected to revert when ridership returns.

Figure 5: GHG Emissions - Generated, Displaced and Net (MTCO₂e)

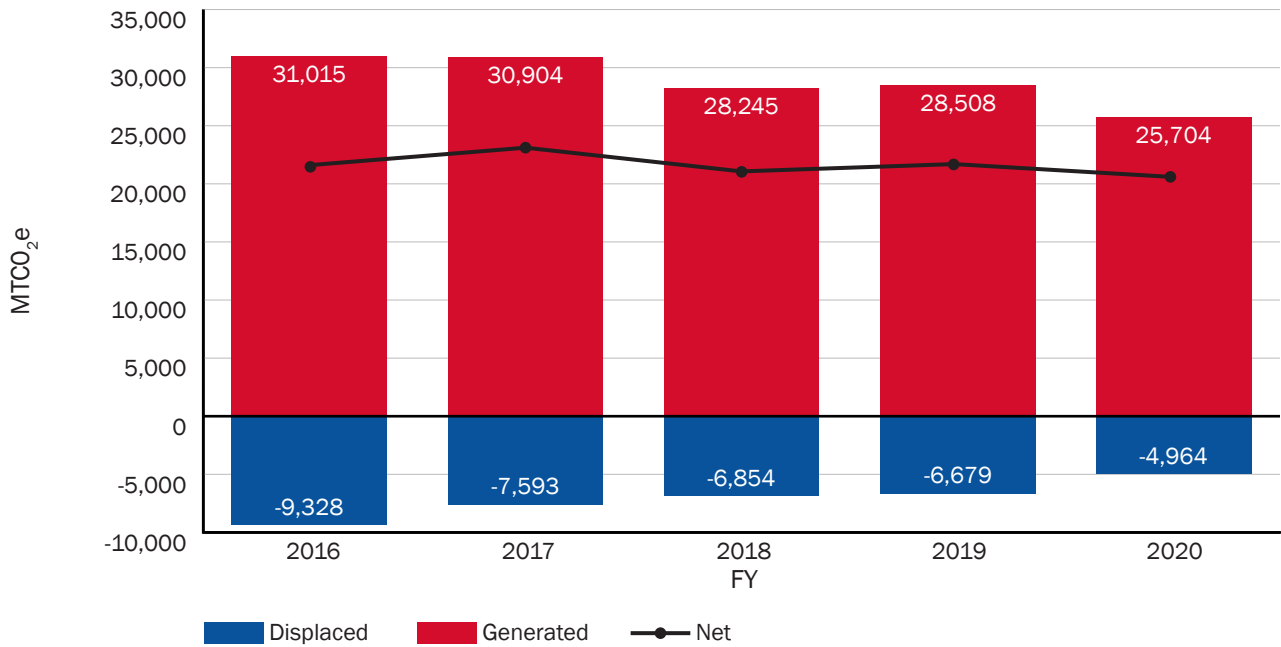
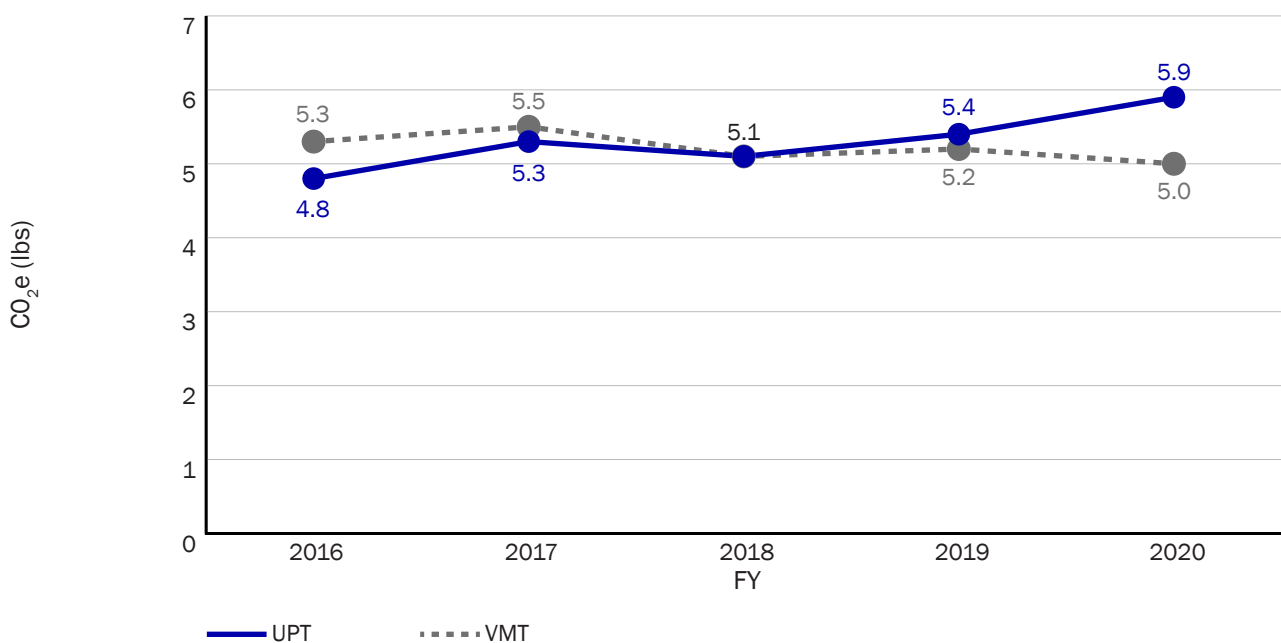


Figure 6: Generated GHG Emissions per Boarding and Vehicle Mile

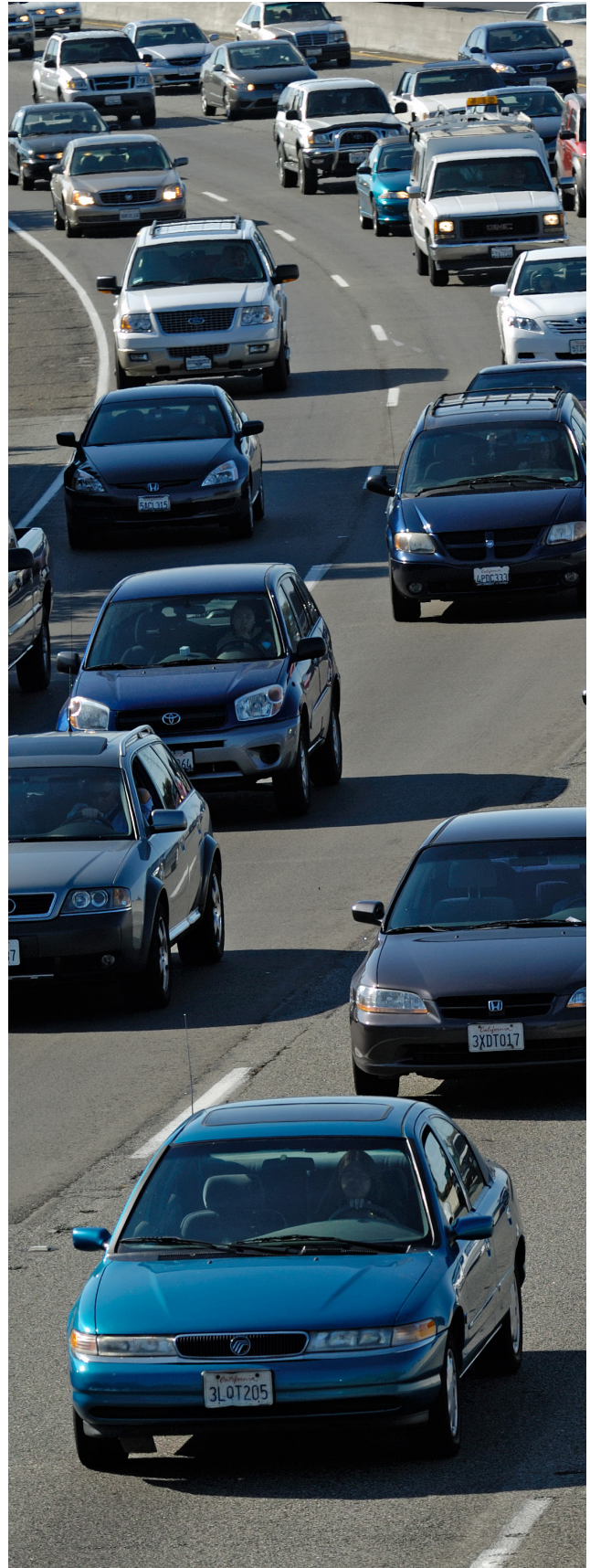


Employee Commuting

Emissions associated with employee commuting were calculated as part of SamTrans' indirect GHG emissions. As shown in [Figure 4 on page 16](#), employee commuting contributes to approximately 4% of total SamTrans GHG emissions.

Annual employee vehicle miles traveled was estimated based on anonymized employee zip code information, workplace location, and the conservative assumptions that all employees are full time and commute to work five days a week by passenger vehicle. The estimate is not typically adjusted to account for employees who telecommute. However, an adjustment was made for FY2020 to include an estimate that two-thirds of employees who work at the Central Administrative Offices (Central) worked remotely between March and June 2020. Nearly all the employees based out of the North and South Base Maintenance and Operations Facilities are assumed to work onsite. Vehicle miles traveled from third-party contractors are not included. With these assumptions, employee commute related emissions decreased approximately 10% between FY2018 and FY2020, due to COVID-19.

Emissions associated with commuting via car were calculated based on Bay Area carpooling trends from the American Community Survey (ACS) and vehicle emissions from the California Air Resources Board Emission Factor Database (EMFAC 2014).



Criteria Air Pollutants

Criteria air pollutants (CAPs) include pollutants that cause smog and acid rain, and have been linked to negative health effects. SamTrans' vehicles emit CAPs when they burn fossil fuels like diesel and gasoline, but they also displace CAPs that otherwise would have been emitted if passengers had chosen to drive alone instead of taking public transit. Approximately 98% of the CAPs emitted by SamTrans are from the diesel revenue fleet. Nitrogen oxides (NOx) represent approximately 68% of CAPs generated by SamTrans.

In 2018, SamTrans purchased 55 heavy-duty clean-diesel articulated buses, which replaced articulated bus models from 2002 that exceeded their useful life.

These newer vehicles are more environmentally friendly and produce 87% less NOx than the older models, and decreased CAPs by approximately 18%. In **Figure 7**, the net reduction in CAPs is shown in a line graph, where the generated and displaced CAPs are shown in bars above and below the line. SamTrans' transition to cleaner vehicles and to zero-emission buses is expected to continue to reduce CAP generation.

Figure 8 shows SamTrans generated CAPs normalized by SamTrans VM and boardings. SamTrans' CAPs per VM have been steadily declining over the past several years. CAPs per boarding showed an increase between FY2018 and FY2020 due to COVID-19 ridership impacts.

Figure 7: Criteria Air Pollutants - Generated, Displaced and Net

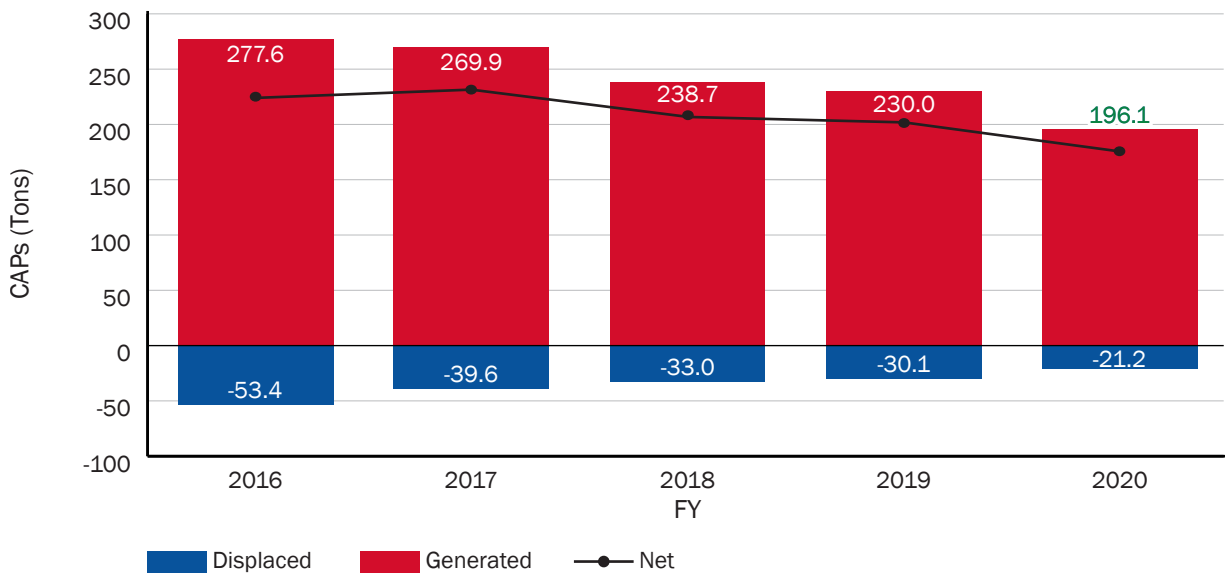
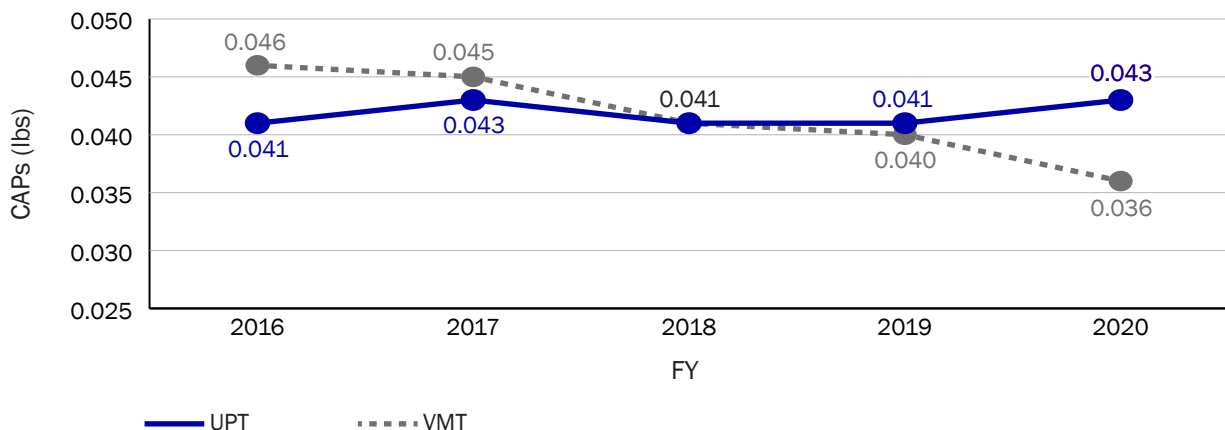


Figure 8: Criteria Air Pollutants Generated per Boarding and Vehicle Mile



Energy Use

Fleet

SamTrans' fleet is made up of vehicles that operate on diesel, gasoline, biodiesel, and electricity. SamTrans-operated bus routes (SamTrans fixed-route) only use diesel fuel. SamTrans has purchased ten electric buses, and contracts fixed-route buses and shuttles that use diesel, gasoline, and biodiesel. SamTrans' paratransit service, which includes Redi-Wheels and RediCoast, uses diesel and gasoline.

SamTrans' non-revenue fleet includes electric vehicles and gasoline-electric hybrid employee pool cars, as well as supervisor vehicles, maintenance trucks, and specialty vehicles (like money-collection and ticket vending machine trucks) that use gasoline. Diesel vehicles have been phased out of SamTrans' non-revenue fleet entirely and SamTrans has added several battery-electric vehicles to its non-revenue fleet that will soon enter service.

The revenue fleet made up 93% of SamTrans' total energy use (fleet and facilities) in FY2020 in thousands of British Thermal Units (kBtu). This energy usage primarily resulted from the fixed-route bus service diesel fuel consumption as noted in [Figure 9](#), which shows gallons of fuel by type. While SamTrans consumed nearly 2 million gallons of diesel in FY2020, overall diesel use decreased by 3% since FY2018. Gasoline usage decreased by approximately 63% between FY2018 and FY2020 due to the transition from gasoline to diesel paratransit vehicles, driver shortages, and the reduction in service during COVID-19.

As of 2020, the revenue fleet used only a small amount of biodiesel (only 6,442 gallons) and no CNG. SamTrans plans to transition to renewable diesel by January 2022. For the first time, bus electricity consumption was reported in FY2020, as new battery-electric buses were tested.

SamTrans is taking progressive steps to transition its revenue fleet to zero-emission vehicles. The fleet already includes 25 diesel-electric hybrid buses, and SamTrans anticipates transitioning the rest of the fleet to battery-electric by replacing them at the end of their useful lives. Per the approved ICT Plan, SamTrans is currently planning to achieve this by purchasing a mix of battery-electric and conventional buses from 2023 to 2026, then move to purchasing mainly battery-electric vehicles. Deploying zero-emission buses will dramatically reduce the agency's GHG emissions, advance State and regional air quality goals, and improve local air quality. The District aims to achieve a zero-emission fleet by 2038, ahead of the California Air Resource Board's (CARB's) statewide goal of transforming all public fleets to zero-emission bus technology by 2040.

[Figure 10](#) shows the revenue fleet energy intensity over time by UPT and VM. The energy intensity per UPT, or energy per boarding, increased in FY2020 due to COVID-19-ridership decline. Energy intensity by VM decreased slightly compared to FY2018 for the same reason; with fewer riders, SamTrans' service is less efficient.



Figure 9: Vehicle Energy Use by Type

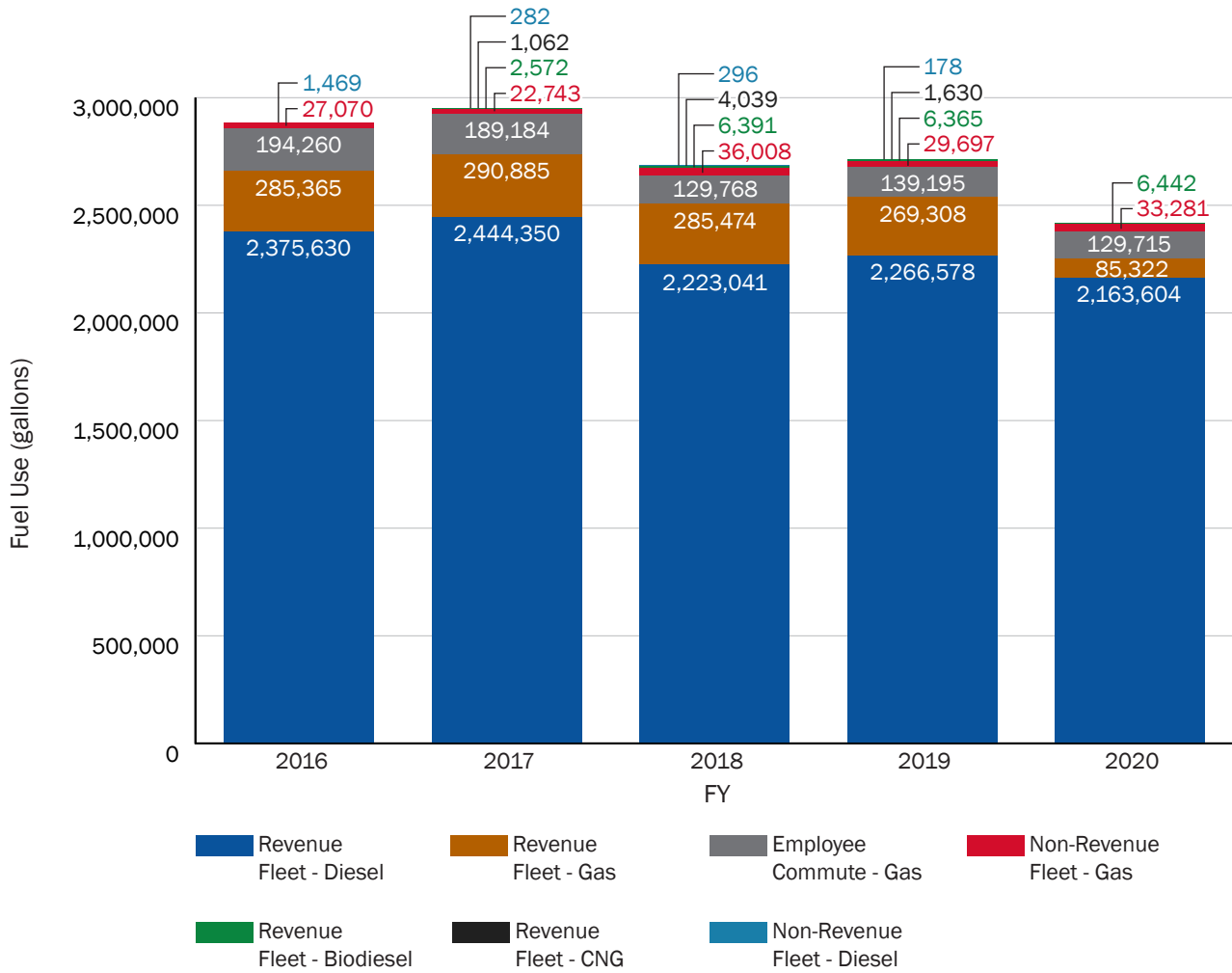
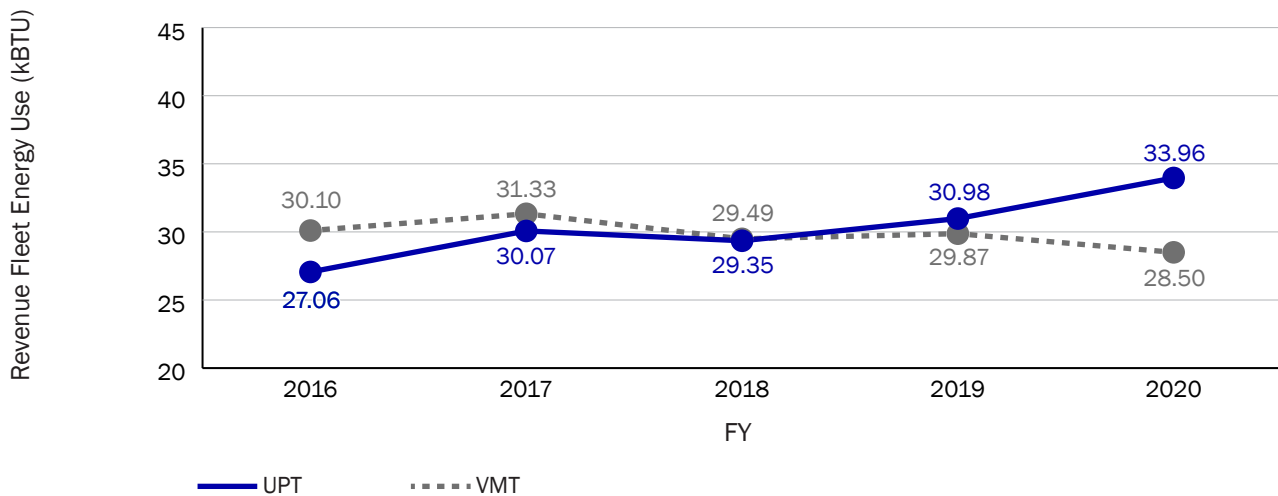


Figure 10: Revenue Fleet Energy Use per Boarding and Vehicle Mile



Facilities

The District's four primary facilities include Central, North Base, South Base, and the Brewster Depot, which is currently used by contracted bus and paratransit services. Many administrative functions for SamTrans, Caltrain, the San Mateo County Transportation Authority, and the San Mateo County Express Lanes Joint Powers Authority are shared and based out of the Central Administrative Offices located in San Carlos. However, the energy use and emissions associated with San Carlos building, which is owned and managed by the San Mateo County District, are only included in the SamTrans inventory. These four facilities use electricity for lighting, office equipment, maintenance equipment, and HVAC. Central, North Base and South Base also use natural gas for heating. Additionally, the District operates the Linda Mar and Colma Park & Rides which use electricity for lighting.

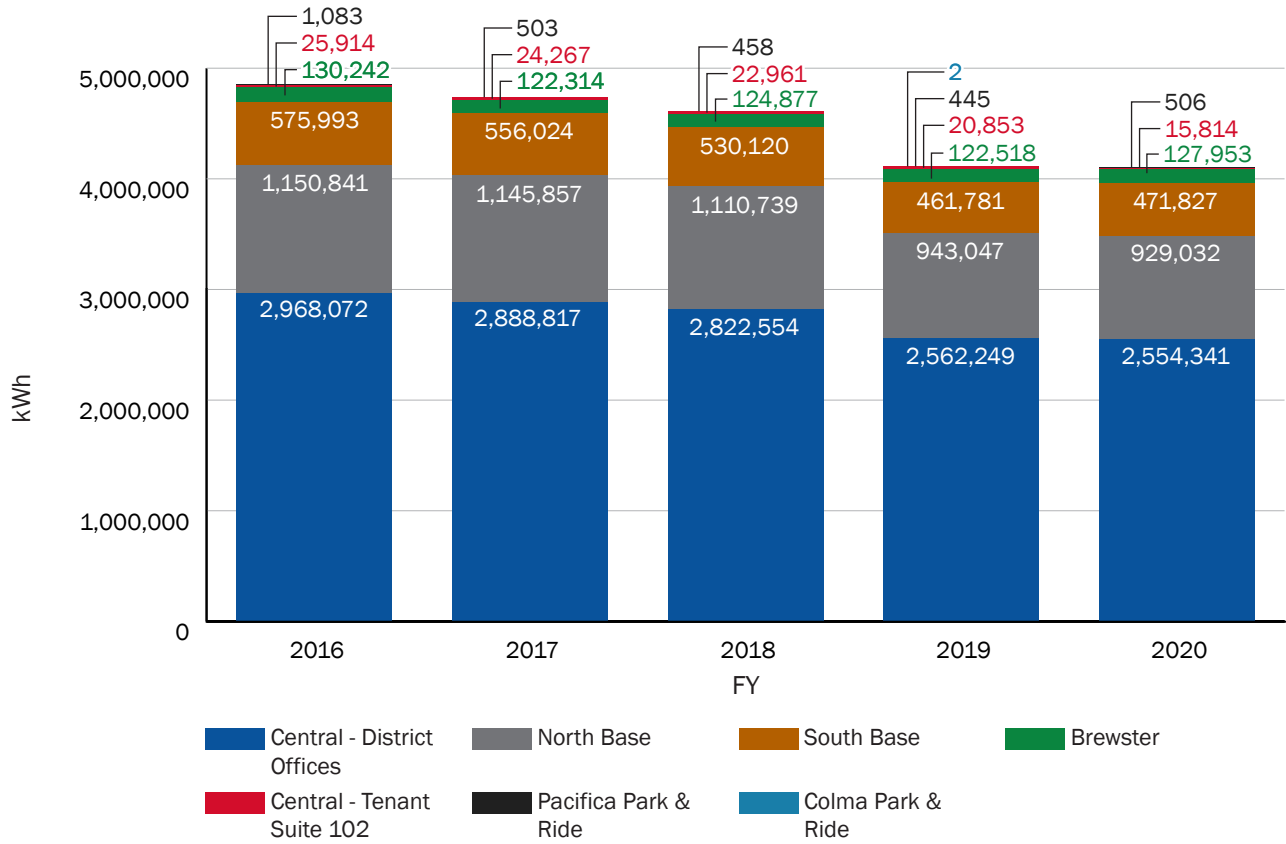
Figure 11 shows electricity use by facility in kilowatt-hours (kWh). Overall electricity usage has steadily declined with energy efficiency improvements. Total electricity consumption decreased by approximately 11% between FY2018 and FY2020. Over the next few years, SamTrans plans to replace all "T8" lights in North and South Bases to LEDs.

SamTrans procures 100% GHG-free and renewable energy through Peninsula Clean Energy. Therefore, SamTrans has zero GHG emissions associated with electricity consumption.

Figure 12 shows natural gas use for North Base, South Base, and the Central Administrative Offices. Natural gas usage decreased by approximately 39% between FY2018 and 2020, caused by an inactive natural gas line under repair at South Base.

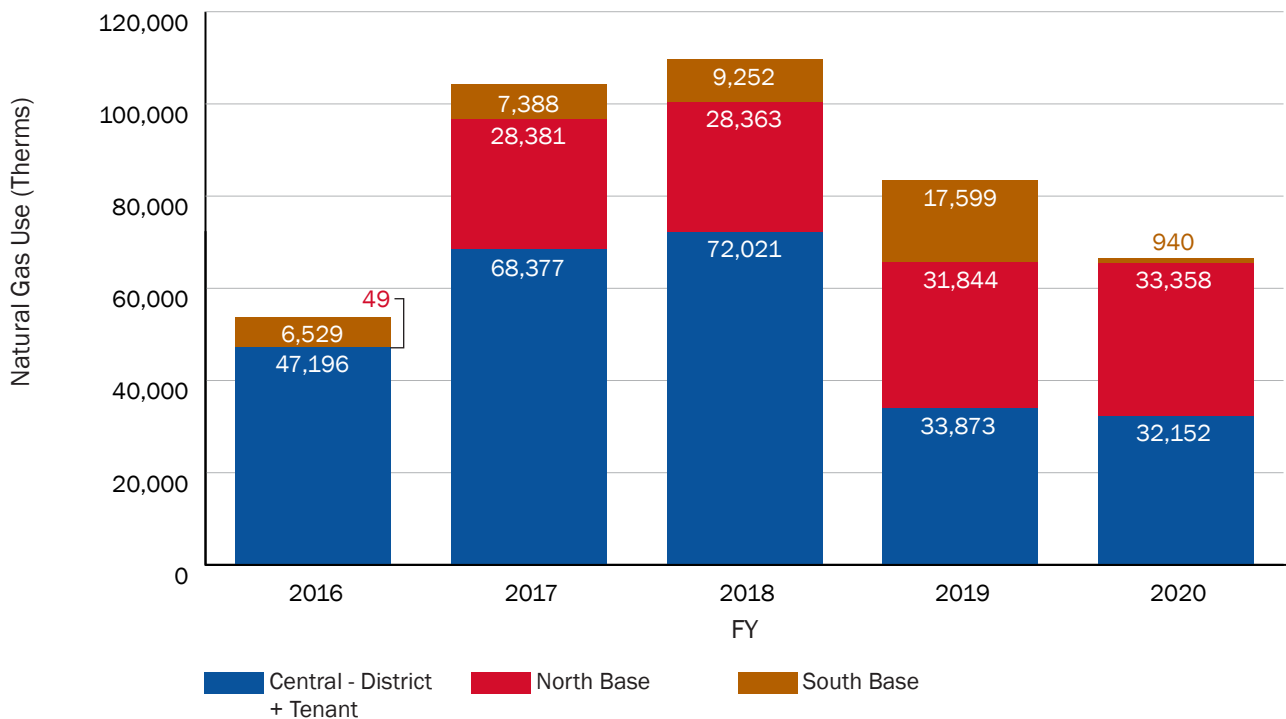


Figure 11: Electricity Use per Facility



Note: As of FY2020, SamTrans is no longer renting the tenant space in the Central office.

Figure 12: Natural Gas Use per Facility



Water Use

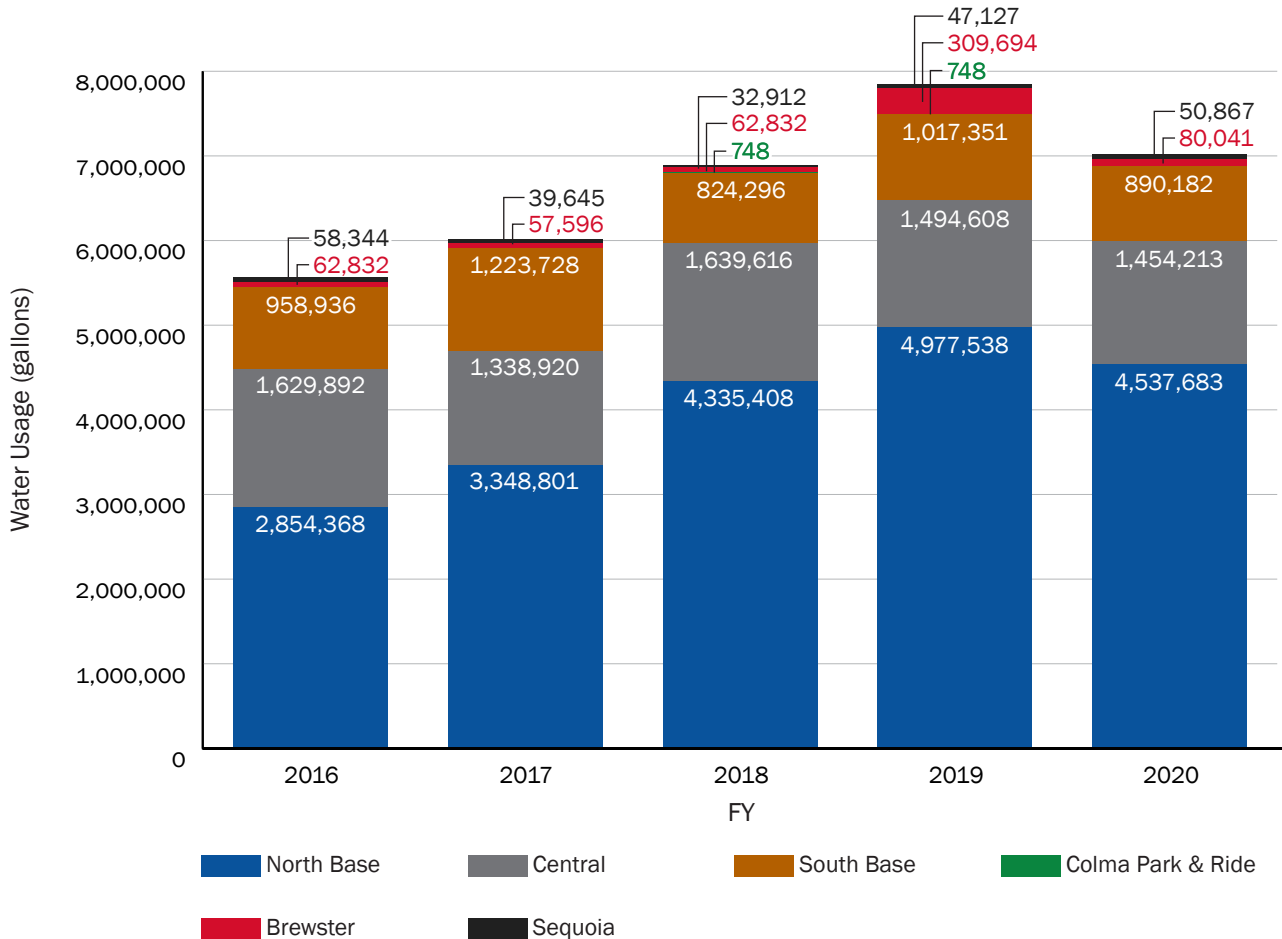
SamTrans uses water for potable consumption, bus washing, and typical commercial water uses such as restrooms and showers. SamTrans minimizes water use wherever possible and no longer uses water for irrigation. Bus washing at each facility is conducted using a closed loop system to minimize water use. At the South Base facility, about 70% of water is recovered by the new bus washing system.

Figure 13 shows water usage per facility. SamTrans consumed over 7.8 million gallons of water in FY2019 and over 7 million gallons of water in FY2020. This represents a 2% increase in water use compared to FY2018.

As shown in **Figure 13**, the North Base facility uses most total water, followed by the Central and South Base facilities. The Sequoia facility, which is the Redwood City Transit Center, used a small amount of water, and water use was nearly eliminated at the park and ride locations. Brewster experienced a water leak during 2019 on both sides of the meter which resulted in a notable increase in water use in FY2019.

Emissions from water are generated indirectly through the combustion of fossil fuels in electricity generation for water delivery, conveyance, and treatment. Though SamTrans does not directly control these emissions, they are included in this inventory because any emissions are a consequence of SamTrans' use of the water.

Figure 13: Water Use per Facility



Waste and Diversion

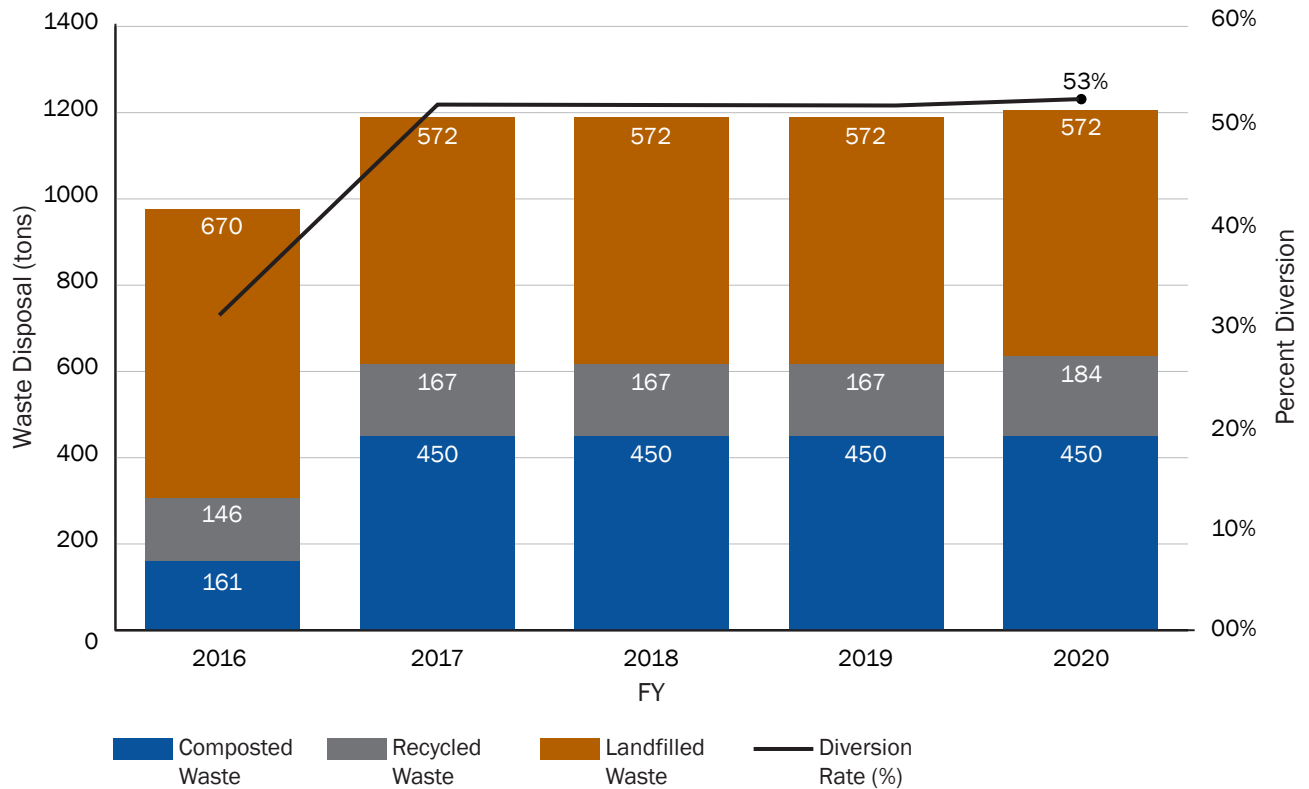
SamTrans-generated waste consists of municipal waste from passengers (paper, food scraps, bottles, cans, and other common recyclables) and employees (from typical office activities and low-impact maintenance activities). Emissions from waste sent to landfill are included in this inventory, but industrial waste (such as hazardous waste and large metal scrap recycling), construction, and demolition waste are accounted for by the construction company performing the work, and hence are not included in the graph below.

Waste and diversion (recycling and composting) rates are estimated through invoices from SamTrans' waste service provider. For the purposes of this inventory, SamTrans assumes that all landfill, recycling, and

organics collection containers are 80% full when collected each week. This assumption may overstate the actual amount of waste generated and diverted, but is the best estimate available at this time, as SamTrans' waste hauler does not report customer waste by actual weight, only volume of container capacity and scheduled pickup frequency.

Figure 14 shows total landfilled, recycled, and composted waste as bars per fiscal year. The total diversion rate, measured as the percentage of total waste diverted as recycling or compost, is shown as a blue line. SamTrans' total diversion rate increased by one percentage point between FY2018 and FY2020 due to an increase in recycling collection at South Base.

Figure 14: Waste Disposal by Type



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CURRENT AND PLANNED INITIATIVES



EXACT FARE PLEASE

CAUTION- KNEELING BUS
AND WHEELCHAIR RAMP

Current and Planned Initiatives

SamTrans has begun implementing the ICT Plan detailing how the agency will transition its bus fleet to zero-emission buses over the next twenty years. SamTrans will procure design services for the electrical and charging infrastructure to be installed at North Base and South Base. SamTrans plans to construct the required infrastructure, including overhead gantry structures and solar photo voltaic panels, over two phases.

By implementing the ICT Plan, SamTrans will transition

its revenue fleet to zero emission vehicles by 2038. This transition away from fossil fuels will also improve the health and well-being of SamTrans riders and community members across the Bay Area by reducing the impacts of transportation on air quality and climate change.



Data Sources and Methodology

See the Caltrain Sustainability Inventory Technical Report (internal document) for more information on data sources and methodologies applied.

ⁱ GHG emissions generated calculated using CARB EMFAC 2014, GREET 2016 for CNG and biodiesel, PG&E and PCE power content labels, the EPA eGRID, California Energy Commission's California's Water-Energy Relationship (2005) and the U.S. Community Protocol for Accounting and Reporting of GHG Emissions Appendix E: Solid Waste Emission Activities and Sources (2012).

ⁱⁱ GHG emission displacement calculations based on the APTA mode shift calculation [displaced/avoided trips (VM) = PMT (miles) x 0.42] and EMFAC 2014 emissions factors.

ⁱⁱⁱ CAPS generated calculated using CARB EMFAC 2014.

^{iv} CAPS displaced based on APTA mode shift calculation [displaced/avoided trips (VM) = PMT (miles) x 0.42] and EMFAC 2014 emissions factors.

^v Facility energy consumption data provided by PG&E. Standard conversion factors used to convert kWh and therms to kBTU.

^{vi} Data obtained from FTA NTD form A-30 (revenue fleet); SamTrans non-revenue vehicle fleet tracking spreadsheet (non-revenue fleet). Standard conversion factors used to convert all fuels to kBTU.

^{vii} Water consumption data provided by California Water Service (CalWater) and the City of Redwood.

^{viii} Waste and diversion data obtained through Recology invoices. Cubic yards converted to tons using California Department of Resources Recovery and Recycling facility information (FacIT) conversion factors.

^{ix} Employee commuting VMT calculated based on anonymous SamTrans employee zip code information, work locations and average commute mode data from the American Community Survey (ACS).

